

WHAT IS CLAIMED IS:

1. A method for processing data packets for transmission over a communications channel, comprising:
- pre-processing data packets for transmission over the communications channel
- 5 including performing a first coding operation on those data packets to form pre-processed data packets;
- detecting a current condition; and
- processing the pre-processed data packets based on the detected current condition to form processed data packets ready for transmission over the communications channel,
- 10 wherein the pre-processing does not depend on the current condition.
2. The method in claim 1, wherein the current condition is the current condition of the communications channel.
3. The method in claim 2, wherein the current condition is the current condition of the communications channel during a current transmission time interval.
- 15 4. The method in claim 1, wherein the current condition relates to a communications service.
5. The method in claim 1, wherein the pre-processing includes channel encoding the data packets at a fixed coding rate.
6. The method in claim 1, wherein the pre-processing includes combining the
- 20 data packets into data blocks.
7. The method in claim 6, wherein the pre-processing includes adding supplemental bits to each of the data packets before combining.
8. The method in claim 7, wherein the supplemental bits include one or more of the following types of information: error detection information, error correction
- 25 information, tail information, and data packet sequence information.

9. The method in claim 6, wherein the pre-processing includes channel encoding the data blocks at a fixed coding rate to form the pre-processed data blocks.

10. The method in claim 1, wherein the processing includes obtaining a coding rate desired for the current condition.

11. The method in claim 1, wherein the processing includes employing a modulation scheme desired for the current condition.

12. The method in claim 1, wherein the processing includes both obtaining a coding rate and employing a modulation scheme desired for the current condition.

13. The method in claim 1, wherein the processing includes combining the pre-processed data packets.

14. The method in claim 13, wherein the combining is performed based on the current condition.

15. The method in claim 13, wherein the processing further includes manipulating the combined pre-processed data packets to achieve a coding rate desired for the current condition.

16. The method in claim 15, wherein the manipulating is performed in accordance with a puncturing scheme that achieves the desired coding rate.

17. The method in claim 14, wherein the processing further includes modulating the manipulated data in accordance with a modulation scheme desired for the current condition.

18. The method in claim 6, further comprising:
waiting for an acknowledgement signal for each of the data blocks, and
if an acknowledgement signal is not received for one of the data blocks,
retransmitting the data block.

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19. The method in claim 18, further comprising:
storing the data blocks in a retransmission buffer awaiting the acknowledgement
signal.

20. The method in claim 19, further comprising:
5 retransmitting an unacknowledged data block using the same processing employed
when the unacknowledged data block was first transmitted.

21. The method in claim 19, further comprising:
retransmitting an unacknowledged data block using different processing from the
processing employed when the unacknowledged data block was first transmitted.

10 ~~22.~~ A method for processing data packets, comprising:
combining a first set of data blocks to produce a first set of combined data blocks;
combining a second set of data blocks to produce a second set of combined data
blocks;
encoding the first set of combined data blocks to produce a first channel encoded
15 data block;
encoding the second set of combined data blocks to produce a second channel
encoded data block;
combining the first and second channel encoded data blocks to produce a
combined channel encoded data block;
20 puncturing one or more bits from the combined channel encoded data block in
accordance with a desired coding rate; and
modulating the punctured data block in accordance with a desired modulation
scheme.

23. The method in claim 22, further comprising:
25 adding supplemental information to a first set of data packets to produce the first
set of data blocks, and
adding supplemental information to a second set of data packets to produce the
second set of data blocks.

24. The method in ~~claim 22~~, further comprising:
detecting a current transmission condition.

25. The method in claim 24, further comprising:
determining how the first and second channel encoded data blocks should be
5 combined based on the detected condition.

26. The method in claim 24, further comprising:
determining the desired channel rate based on the detected condition.

27. The method in claim 24, further comprising:
determining the desired modulation scheme based on the detected condition.

28. The method in claim 24, further comprising:
detecting a change in current transmission condition, and
determining how the first and second channel encoded data blocks should be
combined based on the changed condition.

29. The method in claim 24, further comprising:
detecting a change in current transmission condition, and
determining a new desired channel rate from the changed condition.

30. The method in claim 24, further comprising:
detecting a change in current transmission condition, and
determining a new desired modulation scheme from the changed condition.

31. The method in claim 22, further comprising:
waiting for an acknowledgement signal for the first and second channel encoded
data blocks;
detecting that one of the first and second channel encoded data blocks is not
acknowledged; and
25 retransmitting the one channel encoded data block.

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32. The method in claim 22, further comprising:
storing the first channel encoded data block in a first buffer, and
storing the second channel encoded data block in a second buffer.

5 33. The method in claim 32, further comprising:
retransmitting one of the first or second encoded data blocks from a corresponding
one of the first and second buffers.

34. Apparatus for use in a transmitter which transmits data over a
communications channel, comprising
a first processing stage configured to pre-process data packets for transmission over
the communications channel including performing a first coding operation on those data
packets to form pre-processed data packets;
a detector configured to detect a current communications condition; and
a second processing stage configured to process the pre-processed data packets
based on the detected communications condition to form processed data packets ready for
transmission over the communications channel,
15 wherein the first processing stage pre-processing does not depend on the current
communications condition.

35. The apparatus in claim 34, further comprising:
a controller configured to control the configuration of the second processing stage
20 based on the detected communications condition.

36. The apparatus in claim 34, wherein the first processing stage includes a
channel encoder configured to encode the data packets at a fixed coding rate.

37. The apparatus in claim 34, wherein the first processing stage is configured to
combine the data packets into data blocks.

25 38. The apparatus in claim 37, wherein the first processing stage is configured to
add supplemental bits to each of the data packets before combining.

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39. The apparatus in claim 38, wherein the supplemental bits include one or more of the following types of information: error detection information, error correction information, tail information, and data packet sequence information.

40. The apparatus in claim 34, wherein the second processing stage is configured to obtain a coding rate desired for the current condition.

41. The apparatus in claim 34, wherein the second processing stage is configured to employ a modulation scheme desired for the current condition.

42. The apparatus in claim 34, wherein the second processing stage is configured to combine the pre-processed data packets.

43. The apparatus in claim 42, wherein the combining is performed based on the current condition.

44. The apparatus in claim 34, wherein the second processing stage is configured to manipulate the combined pre-processed data packets to achieve a coding rate desired for the current condition using a puncturing scheme.

45. The apparatus in claim 34, further comprising:
a buffer configured to store the pre-processed data packets.

46. Apparatus for use in a transmitter which transmits data over a communications channel, comprising:

- a first combiner configured to produce a first set of combined packets;
- a second combiner configured to produce a second set of combined packets;
- a first encoder, coupled to the first packet combiner, configured to encode the first set of combined packets;
- a second encoder, coupled to the second packet combiner, configured to encode the second set of combined packets;
- a third combiner, coupled to the first and second encoders, configured to combine the first and second set of encoded packets into a combined output;

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a puncturing controller, coupled to the third combiner, configured to puncture the combined output to achieve a desired coding rate; and

a modulator, coupled to the puncturing controller, configured to modulate the punctured output for transmission over the communications channel.

- 5 47. The apparatus in claim 46, further comprising:
a first packet processor configured to add supplemental information to a first set of data packets to produce the first set of data blocks, and
a second packet processor configured to add supplemental information to a second set of data packets to produce the second set of data blocks.

- 10 48. The apparatus in claim 46, further comprising:
a detector configured to detect a current transmission condition.

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49. The apparatus in claim 48, further comprising:
a controller configured to determine how the first and second channel encoded data blocks should be combined based on the detected condition.

15 50. The apparatus in claim 48, further comprising:
a controller configured to determine the desired channel rate based on the detected condition.

20 51. The apparatus in claim 48, further comprising:
a controller configured to determine the desired modulation scheme based on the detected condition.

52. The apparatus in claim 48, wherein the first and second packet combiners and the first and second encoders are configured to function independently of the transmission condition.

25 53. The apparatus in claim 46, further comprising:
a first buffer storing the first channel encoded data block, and
a second buffer storing the second channel encoded data block.